AMENDMENTS TO THE CLAIMS

Please amend the claims as follows.

1. – 4. (Canceled)

5. (Previously Presented) A process for detection of gas bubbles in a liquid in a water circuit for cooling an internal combustion engine adapted to a device comprising: a light source, a light detector, wherein the light source and the light detector are immersed in the liquid in the water circuit cooling the internal combustion engine, and a data controlling and processing unit linked to a client system, comprising the steps of:

    emitting light from the light source

    for acquisition of a first measurement and a subsequent measurement known as a successive measurement of light intensity perceived by the light detector, and

    for calculation of a variation between two successive measurements of said light intensity;

    incrementing a warning counter by a predefined value A when the variation in light intensity perceived by the light detector between two successive measurements is greater than the threshold S and decrementing said warning counter by a predefined value B in the opposite case; and

    sending to the client system information indicating that the bubble content is greater than an authorized maximum content when said warning counter exceeds a predefined alarm value C over a period greater than a predefined time delay period.

6. (Currently Amended) A process for detection of gas bubbles in a liquid in a water circuit for cooling an internal combustion engine adapted to a device comprising: a light source, a light detector, wherein the light source and the light detector are immersed in the liquid in the water circuit cooling the internal combustion engine, and a data controlling and processing unit linked to a client system, comprising:

    emitting light from the light source for acquisition of a first measurement and a subsequent measurement known as a successive measurement of light intensity perceived by the light detector, and for calculation of a variation between two successive measurements of said light intensity;

comparing the variation between the two successive measurements to a predefined threshold value S;

incrementing a warning counter by a predefined value A when the variation in light intensity perceived by the light detector between two successive measurements is greater than the threshold S;

decrementing said warning counter by a predefined value B in the opposite case;

sending to the client system information indicating that a bubble content is greater than an authorized maximum content when said warning counter exceeds a predefined alarm value C,

wherein the process further comprises~~The process according to claim 4, further comprising~~ a ceasing step of sending to the client system information indicating that the bubble content is greater than the authorized maximum content when the warning counter is less than a predefined final alarm value D.

7. (Currently Amended) The process according to claim [[1]] 6, further comprising calculating an average value from a plurality of variations between two successive measurements of light intensity.

8. (Previously Presented) The process according to claim 7, further comprising sending to the client system information indicating the average value of the successive variations of the light intensity perceived by the light detector.

9. (Previously Presented) A process for detection of gas bubbles in a liquid in a water circuit for cooling an internal combustion engine adapted to a device comprising: a light source, a light detector, and a data controlling and processing unit linked to a client system, wherein the light source and the light detector are immersed in the liquid in the water circuit cooling the internal combustion engine, wherein the data controlling and processing unit comprising a control module of the light source is configured to periodically polarize said light source on several polarization levels, comprising the steps of:

emitting light from the light source

for acquisition of a first measurement and a subsequent measurement known as a successive measurement of light intensity perceived by the light detector, and

for calculation of a variation between two successive measurements of said light intensity.

10. (Previously Presented) The process according to claim 9, wherein calibration of the source and the light detector is carried out synchronously by periodic polarization of the light source.

11. (Currently Amended) The process according to claim [[1]] 6, wherein the light source and the light detector are arranged noticeably orthogonally, acquiring successive measurements of the intensity of light reflected from the surface of a gas bubble in a direction noticeably orthogonal to the direction of incidence towards the light detector.

12. (Currently Amended) The process according to claim [[1]] 6, wherein the source and the light detector are arranged noticeably adjacently, acquiring successive measurements of the intensity of light reflected from the surface of a gas bubble in a direction noticeably parallel to the direction of incidence towards the light detector.

13. (Previously Presented) The process according to claim 11, further comprising a temperature measuring element and at least one switch linked to said temperature measuring element, wherein the switch is configured to change state during the detection of a gas bubble.

14. (Previously Presented) The process according to claim 13, wherein the data controlling and processing unit transmits a high-amplitude level signal proportional to the temperature of the liquid when the presence of a bubble is not detected or low level when the presence of a bubble is detected, via an interface module to the client system, and wherein the interface module and the client system are linked only by a single wire.

15. (Previously Presented) A process for detection of gas bubbles in a liquid in a water circuit for cooling an internal combustion engine adapted to a device comprising: a light source, a light detector, a data controlling and processing unit linked to a client system via an interface module, and a system of electrodes configured to measure the resistivity of the ambient conditions, wherein, the client system is informed, via the interface module, by the data controlling and processing unit, that the source and the light detector are not immersed in the liquid when the system of electrodes identifies the ambient conditions as not being the liquid, comprising the steps of:

emitting light from the light source

for acquisition of a first measurement and a subsequent measurement known as a successive measurement of light intensity perceived by the light detector, and

for calculation of a variation between two successive measurements of said light intensity.

16. (Previously Presented) The process according to claim 15, further comprising a temperature measuring element and at least one switch linked to said temperature measuring element, wherein the switch is configured to change state during the detection of a gas bubble and during the absence of liquid.

17. (Previously Presented) The process according to claim 16,

wherein the data controlling and processing unit transmits a high-amplitude level signal proportional to the temperature of the liquid when the presence of a bubble is not detected and when the light source and the light detector are immersed in the liquid, via the interface module to the client system,

wherein the data controlling and processing unit transmits a low level signal when the presence of a bubble is detected or when the light source and the light detector are not immersed in the liquid, via the interface module to the client system, and

wherein the interface module and the client system are linked only by a single wire.

18. (Currently Amended) The process according to claim [[1]] 6, wherein the source and the light detector are arranged noticeably opposite each other, making it possible to send out a light of a specific wavelength from the light source such that it is strongly (reciprocally weakly) absorbed by the liquid and slightly (reciprocally strongly) absorbed by the gas constituting the bubbles.

19. (Currently Amended) The process according to claim [[1]] 6, wherein the source and the light detector are arranged noticeably opposite each other, acquiring successive measurements of light intensity deflected towards the light detector should the case arise in the presence of bubbles due to the diffraction index differences between the liquid and the gas constituting the bubbles at the level of the surface of said bubbles.

20. (Previously Presented) The process according to claim 18, further comprising a temperature measuring element and at least one switch linked to said temperature measuring element, wherein the switch is configured to change state periodically.

21. (Previously Presented) The process according to claim 20, wherein the data controlling and processing unit is linked to the client system via an interface module and transmits, via the interface module, to the client system, information on the temperature of the liquid and the presence of bubbles in the liquid, wherein the interface module and the client system are linked only by a single wire, and wherein a periodic signal is supplied to the client system by the interface module.

22. (Previously Presented) The process according to claim 21, wherein the period of said periodic signal is formed by a first phase constituted by a constant high-amplitude level signal proportional to the temperature of the liquid and by a second phase constituted by a train of pulses of modulated width, and wherein the width of the impulses is modulated according to the average value of the successive variations in light intensity perceived by the light detector.

23. (Previously Presented) A process for detection of gas bubbles in a liquid in a water circuit for cooling an internal combustion engine adapted to a device comprising:

a light source, and a light detector and a data controlling and processing unit linked to a client system via an interface module,

wherein the source and the light detector are arranged noticeably opposite each other, making it possible to send out a light of a specific wavelength from the light source such that it is strongly (reciprocally weakly) absorbed by the liquid and slightly (reciprocally strongly) absorbed by the gas constituting the bubbles, and

wherein the client system is informed, via the interface module, that the sensor is not immersed in liquid when the polarization value of the light source is lower than a predefined threshold value T, known as the polarization alarm threshold value, comprising the steps of:

emitting light from the light source for acquisition of a first measurement and a subsequent measurement known as a successive measurement of light intensity perceived by the light detector, and

for calculation of a variation between two successive measurements of said light intensity.

24. (Previously Presented) The process according to claim 23, further comprising a temperature measuring element and at least one switch linked to said temperature measuring element, wherein the switch is configured to change state periodically.

25. (Previously Presented) The process according to claim 24, wherein the data controlling and processing unit transmits, via the interface module, to the client system the information on the temperature of the liquid, the presence of bubbles in the liquid and the non-immersion of the sensor in the liquid, wherein the interface module and the client system being linked only by a single wire, and wherein a periodic signal is supplied to the client system by the interface module.

26. (Previously Presented) The process according to claim 25, wherein the period of said periodic signal is formed from a first phase constituted by a constant high-amplitude level signal proportional to the temperature of the liquid and a second phase constituted by a train of pulses of modulated width, and wherein the width of the impulses is modulated according to the average value of the successive variations in light intensity perceived by the light detector and said width becomes maximum when the sensor is not immersed in the liquid.

27. (Canceled)